

(916) 255-3545

April 9, 1996

Mr. Antero A. Rivasplata, Chief
State Clearinghouse
Office of Planning and Research
1400 Tenth Street
Sacramento, California 95827-2106

NOTICE OF DETERMINATION, STATE CLEARING HOUSE #95082002,
CHINA LAKE AND SALT WELLS LABORATORIES, CHINA LAKE NAVAL
AIR WEAPONS STATION, SITE 49, SURFACE IMPOUNDMENTS AND
SETTLING SUMPS

Dear Mr. Rivasplata:

The Department of Toxic Substances Control, Region 1, has approved a Negative Declaration for the subject project. The project involves the excavation and disposal of some of the ponds and appurtenant structures at the Salt Wells and China Lake Propulsion Laboratories.

The "Initial Study" and "Draft Negative Declaration" were prepared and sent to your office on August 1, 1995. No comments were received regarding the draft Negative Declaration during the public comment period which ended on August 31, 1995. Enclosed please find copies of the Notice of Determination, the Negative Declaration, the Negative Declaration Approval, the DeMinimus Impact Finding, and the Initial Study.

If you have any questions, please contact Mr. Lance McMahan at (916) 255-3674.

Sincerely,

Anthony J. Landis, P.E.
Chief, Northern California Operations
Office of Military Facilities

Enclosures

A U T H O R	L. McMahan 255-3674 LM12W-046 Jan 4-9-96	R E V I E W	See text Bill 4/9/96	R E V I E W	Landis AJL 4-9-96	R E V I E W	FILE CODING China Lake NAWS Site Mit.-F LM12W.046\lyn-a:tracie#8	CLERICAL Lyn DATE MAILED	INITIALS 4/10
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DEPARTMENT OF TOXIC SUBSTANCES CONTROL

REGION 1

10151 CROYDON WAY, SUITE 3

SACRAMENTO, CA 95827-2106

(916) 255-3545



April 9, 1996

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Anthony J. Landis, P.E.
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Enclosures

cc: See next page.



Mr. Antero A. Rivasplata
April 9, 1996
Page Two

cc: Ms. Elizabeth Lafferty
Regional Water Quality Control Board
Lahontan Region
Victorville Branch Office
15428 Civic Drive, Suite 100
Victorville, California 92392-2383

Mr. Jim McDonald
Environmental Project Office (823E00D)
Public Works Department
Naval Air Weapons Station
China Lake, California 93555-6001

Mr. Sherman Chou, P.E.
Environmental Engineer
Restoration-Operational Facilities
Western Division
Naval Facilities Engineering Command
(Code 09ER4sc)
900 Commodore Drive
San Bruno, California 94066-2402

Mr. Woodrow D. Chartier, Co-Chairman
China Lake Restoration Advisory Board
944 West Hermosa Avenue
Ridgecrest, California 93555

NEGATIVE DECLARATION APPROVAL

Project Title: CHINA LAKE AND SALT WELLS LABORATORIES, CHINA LAKE NAVAL AIR WEAPONS STATION, SITE 49, SURFACE IMPOUNDMENTS AND SETTLING SUMPS

State Clearinghouse Number: 95082002

Contact Person and Telephone: Lance McMahan, (916) 255-3674

Project Location: CHINA LAKE NAVAL AIR WEAPONS STATION, CHINA LAKE AND SALT WELLS LABORATORIES, SAN BERNARDINO COUNTY

Project Description:

The China Lake Naval Air Weapons Station's Environmental Project Office is seeking approval by the Department of Toxic Substances Control of a Removal Action Plan which includes the excavation and disposal of some of the clay and synthetic-lined ponds and appurtenant structures at the Salt Wells/China Lake Propulsion Laboratories. Contaminants of concern include volatile organic compounds, explosives, metals, cyanide, and phenols. Disposal of the various waste types would be as follows:

Concrete

Chip samples of concrete from sumps, troughs, vaults and ponds will be collected and analyzed for metals and explosive compounds using Environmental Protection Agency (EPA) Methods 6010 and 8330, respectively, to determine the presence of contamination. If contamination is found above detection limits, the concrete will be excavated and transported for disposal in a Class I landfill. If contamination is below detection limits (i.e., uncontaminated), then the concrete may remain on-site. If uncontaminated concrete can not remain in place (e.g. because of excavation logistics), the concrete will be salvaged on-base by the NAWS resident Seabee Corps or recycled off-base (e.g., pulverized and used for road material).

Gravel

After excavation, the gravel will be disposed of as a hazardous waste.

Synthetic Liners

Two synthetic liners were used in some of the ponds. The top liner of the ponds are assumed to be contaminated and will be steam cleaned prior to sampling for offsite disposal or recycling. Wipe samples will be collected from bottom liners to determine if the bottom liners are contaminated. If the bottom liners are contaminated, then high pressure water/steam will be used to clean the liners. Two wipe samples from each liner will be collected and analyzed to determine if the liners are adequately cleaned. Samples will be analyzed for metals and explosive compounds using EPA Methods 6010 and 8330, respectively, to determine the presence of contamination. If contamination is found above detection limits, the liner will be excavated and transported for disposal in a Class I landfill. If contamination is below detection limits, then the liner will be disposed of in a Class III landfill. Wastewater will be collected and stored temporarily in a holding tank for subsequent transportation to an offsite facility.

Piping

Piping used to transport the wastewater to the ponds would be excavated and steam cleaned to remove visible contamination. The piping will then be disposed of in a Class I landfill.

Sludge and Clay Liners

Sump sludge will be removed and treated off-site using incineration. The resulting ash would be disposed of in a Class I landfill. Samples of the pond sludge contained in synthetic-lined ponds will be collected and analyzed to determine how it should be disposed. Water will then be added to the pond sludge to form a slurry. The slurry will be removed with a vacuum truck for temporary storage onsite or for off-site transportation. This method will allow for removal of the top sludge layer without damaging the top liner. The slurry will be treated and disposed of at an appropriately licensed off-site facility. The upper lining of the clay-lined ponds will be removed along with the sludge and transported off-site for incineration.

Confirmatory soil sampling will also be conducted following removal of the waste materials. Cleanup levels have not been established for the soil at the site. Consequently, this is an interim removal action.

NEGATIVE DECLARATION APPROVAL
CHINA LAKE AND SALT WELLS LABORATORIES
CHINA LAKE NAVAL AIR WEAPONS STATION
SITE 49, SURFACE IMPOUNDMENTS AND SETTLING SUMPS

Page 3

The Department of Toxic Substances Control has found on the basis of the Initial Study and comments received on the Negative Declaration that there is no substantial evidence that this project will have a significant effect on the environment.

I hereby approve the Negative Declaration for this project.

Signature: Anthony J. Landis
Anthony J. Landis, P.E.
Chief, Northern California Operations
Office of Military Facilities

Date: 4-9-96

Revised by DTSC, PEAS 5/18/93
NDAPPROV.FRM

**DE MINIMIS IMPACT FINDING
FOR
CHINA LAKE NAVAL AIR WEAPONS STATION
SITE 49
CHINA LAKE/SALT WELLS PROPULSION LABORATORIES
SURFACE IMPOUNDMENTS AND SETTLING SUMPS**

Project Proponent:

China Lake Naval Air Weapons Station
Department of Public Works
Environmental Project Office
China Lake, CA 93555-6001
Contact: Mr. James McDonald

Project Description:

The China Lake Naval Air Weapons Station's Environmental Project Office is seeking approval by the Department of Toxic Substances Control of a Removal Action Plan which includes the excavation and disposal of some of the clay and synthetic-lined ponds and appurtenant structures at the Salt Wells/China Lake Propulsion Laboratories. Contaminants of concern include volatile organic compounds, explosives, metals, cyanide, and phenols. Disposal of the various waste types would be as follows:

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After excavation, the gravel will be disposed of as a hazardous waste.

Synthetic Liners

Two synthetic liners were used in some of the ponds. The top liner of the ponds are assumed to be contaminated and will be steam cleaned prior to sampling for offsite disposal or recycling. Wipe samples will be collected from bottom liners to determine if the bottom liners are contaminated. If the bottom liners are contaminated, then high pressure water/steam will be used to clean the liners. Two wipe samples from each liner will be collected and analyzed to determine if the liners are adequately cleaned. Samples will be analyzed for metals and explosive compounds using EPA Methods 6010 and 8330, respectively, to determine the presence of contamination. If contamination is found above detection limits, the liner will be excavated and transported for disposal in a Class I landfill. If contamination is below detection limits, then the liner will be disposed of in a Class III landfill. Wastewater will be collected and stored temporarily in a holding tank for subsequent transportation to an offsite facility.

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Piping used to transport the wastewater to the ponds would be excavated and steam cleaned to remove visible contamination. The piping will then be disposed of in a Class I landfill.

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Sump sludge will be removed and treated off-site using incineration. The resulting ash would be disposed of in a Class I landfill. Samples of the pond sludge contained in synthetic-lined ponds will be collected and analyzed to determine how it should be disposed. Water will then be added to the pond sludge to form a slurry. The slurry will be removed with a vacuum truck for temporary storage onsite or for off-site transportation. This method will allow for removal of the top sludge layer without damaging the top liner. The slurry will be treated and disposed of at an appropriately licensed off-site facility. The upper lining of the clay-lined ponds will be removed along with the sludge and transported off-site for incineration.

Confirmatory soil sampling will also be conducted following removal of the waste materials. Cleanup levels have not been established for the soil at the site. Consequently, this is an interim removal action.

Initial Study Information:

The initial study has been conducted by the Department to evaluate the possibility of significant effect. A copy of the initial study and checklist are attached.

Declaration of No Evidence of Potential Adverse Effect:

When considering the initial study and the record, there is no evidence before the Department that the proposed project will have potential for an adverse effect on wildlife resources or the habitat upon which the wildlife depends.

Declaration of Rebutment of Presumption:

The Department has, on the basis of substantial evidence, rebutted the presumption of adverse effect contained in Section 753.5(d), Title 14 of the California Code of Regulations.

Certification:

The Department of Toxic Substances Control certifies that it, as lead agency, has made the above findings of fact and that based upon the initial study and upon the record, the project will not individually or cumulatively have an adverse effect on wildlife resources, as defined in Section 711.2 of the Fish and Game Code. Signature verifying this certification is attached.

Signature Lance H. McMahan Date 4-9-96
Lance McMahan, Project Manager

Signature Anthony J. Landis Date 4-9-96
Anthony J. Landis, P.E.
Chief, Northern California Operations
Office of Military Facilities

NEGATIVE DECLARATION
CHINA LAKE NAVAL AIR WEAPONS STATION
SITE 49
CHINA LAKE/SALT WELLS PROPULSION LABORATORIES
SURFACE IMPOUNDMENTS AND SETTLING SUMPS

Project Proponent:

China Lake Naval Air Weapons Station
Department of Public Works
Environmental Project Office
China Lake, CA 93555-6001
Contact: Mr. James McDonald

Project Description:

The China Lake Naval Air Weapons Station's Environmental Project Office is seeking approval by the Department of Toxic Substances Control of a Removal Action Plan which includes the excavation and disposal of some of the clay and synthetic-lined ponds and appurtenant structures at the Salt Wells/China Lake Propulsion Laboratories. Contaminants of concern include volatile organic compounds, explosives, metals, cyanide, and phenols. Disposal of the various waste types would be as follows:

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Confirmatory soil sampling will also be conducted following removal of the waste materials. Cleanup levels have not been established for the soil at the site. Consequently, this is an interim removal action.

Project Location:

Site 49 is located in Sections 20-22 and 27-32, Township 26 South, Range 41 East, in the Salt Wells and Indian Wells Valleys. Most of the facilities are contained in the Salt Wells Valley.

Findings of Significant Effect on Environment:

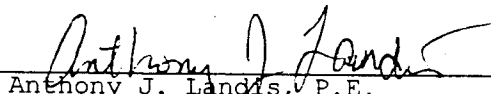
The Department has determined that the project will not have a significant effect on the environment as that term is defined in the Public Resources Code Section 21068.

A copy of the Initial Study which supports this finding is attached.

Mitigation Measures:

This project does not include mitigation measures.

Signature  Date 4-9-96
Lance McMahan, P.E., Project Manager

Signature  Date 4-9-96
Anthony J. Landis, P.E.
Chief, Northern California Operations
Office of Military Facilities

NOTICE OF DETERMINATION

Substitute of Form C

To: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

From: Department of Toxic Substances Control
Office of Policy & Environmental Analysis
Planning and Environmental Analysis Section
400 P Street, Room 4310
P.O. Box 806
Sacramento, CA 95812-0806

Project Title: CHINA LAKE AND SALT WELLS LABORATORIES, CHINA LAKE NAVAL AIR WEAPONS STATION, SITE 49, SURFACE IMPOUNDMENTS AND SETTLING SUMPS

State Clearinghouse Number: 95082002

Contact Person and Telephone: Lance McMahan, (916) 255-3674

Project Location: CHINA LAKE NAVAL AIR WEAPONS STATION, CHINA LAKE AND SALT WELLS LABORATORIES, SAN BERNARDINO COUNTY

Project Description:

The China Lake Naval Air Weapons Station's Environmental Project Office is seeking approval by the Department of Toxic Substances Control of a Removal Action Plan which includes the excavation and disposal of some of the clay and synthetic-lined ponds and appurtenant structures at the Salt Wells/China Lake Propulsion Laboratories. Contaminants of concern include volatile organic compounds, explosives, metals, cyanide, and phenols. Disposal of the various waste types would be as follows:

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NOTICE OF DETERMINATION
CHINA LAKE AND SALT WELLS LABORATORIES
CHINA LAKE NAVAL AIR WEAPONS STATION
SITE 49, SURFACE IMPOUNDMENTS AND SETTLING SUMPS

Page 2

be collected and stored temporarily in a holding tank for subsequent transportation to an offsite facility.

Piping

Piping used to transport the wastewater to the ponds would be excavated and steam cleaned to remove visible contamination. The piping will then be disposed of in a Class I landfill.

Sludge and Clay Liners

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Confirmatory soil sampling will also be conducted following removal of the waste materials. Cleanup levels have not been established for the soil at the site. Consequently, this is an interim removal action.

Date project approved:

This Notice of Determination is filed in compliance with Section 21108 of the Public Resources Code. The Department of Toxic Substances Control (Department), as lead agency, has approved the above described project and the attached Negative Declaration.

The Department has made the determination that the project will not have a significant effect on the environment.

The attached Negative Declaration was prepared for this project pursuant to the provisions of CEQA.

A copy of this Negative Declaration may be examined at the above address of the Department of Toxic Substances Control.

Signature: _____

Anthony J. Landis
Anthony J. Landis, P.E.
Chief, Northern California Operations
Office of Military Facilities

Date: _____

4-8-96

Date received for filing at OPR:

INITIAL STUDY and SPECIAL CHECKLIST

for
Record of Decision/Remedial Action Plan
Proposed Plan for Site 49
China Lake/Salt Wells Propulsion Laboratories'
Surface Impoundments and Settling Sumps
China Lake Naval Air Weapons Station
San Bernardino County

This checklist has two purposes, to identify any reasonable possibility of "significant effect on the environment" as that term is used in Section 21068 of the Public Resources Code, and to identify "adverse effect, either individually or cumulatively, on wildlife" as that term is used in Sections 753.5 (c) and (d) of Title 14 of the California Code of Regulations.

"Significant effect on the environment" (significant effect) means a substantial, or potentially substantial, adverse change in the environment.

"Adverse effect, either individually or cumulatively, on wildlife" means an adverse change of any type or degree, either individually or cumulatively, on any wild animals, birds, plants, fish, amphibians, and related ecological communities, including the habitat upon which the wildlife depends for its continued viability. (Refer to the items contained in the shaded boxes.)

I. PROJECT DESCRIPTION

The China Lake Naval Air Weapons Station's (NAWS) Environmental Project Office is seeking approval by the Department of Toxic Substances Control of an Interim Removal Action Plan which includes the excavation and disposal of contaminated materials from several wastewater ponds and appurtenant structures at the China Lake and Salt Wells Propulsion Laboratories. Specifically, contaminated materials include concrete sumps and troughs, gravel used in leak detection systems, synthetic liners, clay liners, vitrified clay pipe, pond sludge, and sump sludge. Contaminants of concern include volatile organic compounds, explosives, metals, cyanide, and phenols. Disposal of the various waste types would be as follows:

Chip samples of concrete from sumps, troughs, vaults and ponds will be collected and analyzed for metals and explosive compounds using Environmental Protection Agency (EPA) Methods 6010 and 8330, respectively, to determine the presence of contamination. If contamination is found above detection limits, the concrete will be excavated and transported for disposal in a Class I landfill. If contamination is below detection limits, then the concrete may remain on-site. If uncontaminated concrete can not remain in place (e.g. because of excavation logistics), the concrete will be salvaged onsite by the NAWS resident Seabee Corps or recycled offsite (e.g., pulverized and used for road material).

After excavation, the gravel will be disposed of as a hazardous waste.

Two synthetic liners were used in those ponds which had synthetic liners. The top liners of the synthetic ponds are assumed to be contaminated and will be steam cleaned prior to sampling for offsite disposal or recycling. However, prior to steam cleaning the bottom liners, wipe samples will be collected from bottom liners to determine if the bottom liners are contaminated. If the bottom liners are contaminated, then high pressure water/steam will be used to clean the liners. Wastewater will be collected and stored temporarily in a holding tank for subsequent transportation to an offsite facility. Four wipe samples from each liner will be collected and analyzed to determine if the liners are adequately cleaned. Samples will be analyzed for

metals and explosive compounds using EPA Methods 6010 and 8330, respectively, to determine the presence of contamination. If contamination is found above detection limits, the liner will be excavated and transported for disposal in a Class I landfill. If contamination is below detection limits, then the liner will be disposed of in a Class III landfill.

Piping used to transport the wastewater to the ponds will be steam-cleaned to remove contamination for safety purposes prior to excavation. The piping will then be disposed of in a Class I landfill. Wastewater generated from cleaning will be analyzed for pollutants of concern and disposed of accordingly.

Sump sludge will be removed and treated off-site using incineration. The resulting ash would be disposed of in a Class I landfill.

Samples of the pond sludge contained in synthetic-lined ponds will be collected and analyzed to determine how it should be disposed. Water will then be added to the pond sludge to form a slurry. The slurry will be removed with a vacuum truck for temporary storage onsite or for offsite transportation. This method will allow for removal of the top sludge layer without damaging the top liner. The slurry will be treated and disposed of at an offsite facility according to the analytical results.

The upper lining of the clay-lined ponds will be removed along with the sludge and transported off-site for incineration.

This removal action is primarily concerned with the removal of pond and sump components (e.g. sludge, liners, piping, etc.). This removal action does not consider remediation of contaminated soil (beyond pond construction soil) and groundwater caused by leakage of wastewater from the ponds and sumps. However, once all pond and sump components are removed, additional moderate quantities [no more than 10 cubic yards (cy) at each pond/sump system] of any visually contaminated soil will be removed, as part of this removal action. Confirmation soil samples will then be collected.

Final cleanup levels have not been determined for the site. Consequently, regardless of the results of the analyses of confirmation samples, a site investigation will be performed as part of a future remedial action. The site investigation will determine the horizontal and vertical extent of soil contamination and the presence of groundwater contamination. Final cleanup goals will be based on human health and ecological risk assessment which accounts for site specific conditions. The risk assessment will be conducted during the remedial investigation/ feasibility (RI/FS) phase. Therefore, this is an interim removal action for Site 49.

II. BACKGROUND

1. PROJECT PROPONENT

China Lake Naval Air Weapons Station
Department of Public Works
Environmental Project Office
China Lake, CA 93555-6001
Contact: Mr. James McDonald

2. DATE OF CHECKLIST SUBMITTAL

June 27, 1995

3. AGENCY REQUIRING CHECKLIST

Department of Toxic Substances Control

4. NAME OF PROPOSAL

Interim Removal Action Plan, Proposed Plan for Site 49, China Lake/Salt Wells Propulsion Laboratories' Surface Impoundments and Settling Sumps, China Lake Naval Air Weapons Station, San Bernardino County.

5. FACILITY DESCRIPTION

NAWS is located in the southeastern California desert approximately 150 miles northeast of Los Angeles. It is comprised of two major areas, the China Lake Complex and the Randsburg Wash/Mojave B Complex. The China Lake Complex, located in San Bernardino and Kern Counties, contains the majority of the range and test facilities, as well as NAWS headquarters and the China Lake community.

The installation began with the establishment of the Naval Ordnance Test Station (NOTS) at China Lake in 1943, and has since expanded in support of the Department of Defense (DoD) and Navy Research, Development, Test, and Evaluation mission for air warfare systems. The initial function of the installation was threefold: 1) to support the rocket development work then being conducted at the California Institute of Technology for the World War II Office of Scientific Research and Development; 2) to test air-launched rocket weapons; and 3) to furnish primary training in the use of those weapons.

The mission of NAWS is to be: 1) the principal Navy research, development, test, and evaluation center for air warfare systems (except antisubmarine warfare systems) and missile weapon systems; and 2) the national range/facility for parachute test and evaluation. NAWS manages and conducts the complete weapons development process from concept formulation through the entire lifetime of a weapon system, including fleet and production support.

The China Lake and Salt Wells Propulsion Laboratories (CLPL/SWPL) operated an as yet determined number of wastewater disposal ponds and appurtenant structures, 21 of which are included in Site 49. The CLPL/SWPL facilities were constructed during World War II. Originally, the CLPL served as a propellant research and development (R&D) facility for Caltech University and an integrated rocket motor loading plant for the Navy. The SWPL was originally used to test non-nuclear explosive components of atom bombs. In 1954 the Atomic Energy Commission's need for the area ended and the Navy assumed operation of the SWPL. Today and throughout the use of the wastewater disposal ponds, activities which generate industrial wastewater at the

CLPL/SWPL includes the formulation, scale-up, analysis, testing, casting and pressing of various types of propellants (solids and liquids) and explosives. As an R&D facility, the quantity and quality of industrial wastewater generated by the CLPL/SWPL facilities fluctuates with the workload and chemistry of the R&D materials. The current average annual flowrate is approximately 300,000 gallons of wastewater per year from all active CLPL/SWPL facilities. The CLPL/SWPL facilities have served for continued ordnance research and development for nearly 50 years.

From 1946 to 1981 disposal of industrial wastewater generated from R&D activities at SWPL is believed to have been accomplished by discharging to open drainage channels. These channels are now known as IRP Site 8. The wastewater, estimated at approximately 14,150 gallons per day, evaporated or percolated into the soil. During the same time period industrial wastewater generated from R&D activities at CLPL was discharged to open drainage ditches ending in three septic tanks, each with associated leach fields, as well as an unknown number of unlined disposal ponds. The CLPL septic tank system is now known as IRP Site 18. Wastewater discharges to the three leach fields were approximately 7500 gallons per day.

Since the CLPL/SWPL began operations, an unknown number of evaporation ponds have been constructed to collect and treat industrial wastewater generated from R&D work at these facilities. It appears that at least three unlined percolation ponds were constructed at the CLPL facilities to dispose of industrial wastewater generated from research and development work at these facilities. Two of the ponds were identified in the 1984 Initial Study as Site 11. In the early 1980's, additional ponds were constructed in the CLPL/SWPL areas with clay liner systems. Twenty-one of the ponds and associated sumps are included in the Site 49 removal action. As of early 1994, all of the ponds are no longer used. Some are replaced with above ground double-walled, open-air collection tanks.

In the mid 1980's monthly inspections of the ponds leak detection pits indicated that several ponds leaked through the upper clay liner. Based on these observations, a Cease and Desist Order was issued by the CA Regional Water Quality Control Board (CRWQCB) in 1987. As a result, seven ponds were rehabilitated to replace the existing clay liners with double synthetic liners.

Equipment associated with the ponds (e.g., sediment traps, cone clarifiers, and concrete/metal sumps) were used to remove the explosive-laden sludge from the wastewater prior to discharge into the ponds. This explosive-laden sludge also requires removal and disposal.

III. PROJECT LOCATION

Site 49 is located in Sections 20-22 and 27-32, Township 26 South, Range 41 East, in the Salt Wells and Indian Wells Valleys. Most of the facilities are contained in the Salt Wells Valley. A map of Site 49 is attached.

IV. ENVIRONMENTAL SETTING

1. EARTH: TOPOGRAPHY AND GEOLOGY

NAWS is located in the southwestern corner of the Great Basin section of the Basin and Range Physiographic Province. The province is typically characterized by isolated, north-trending mountain ranges separated by desert basins. The Indian Wells Valley is bordered on the west by the southern Sierra Nevada, on the east by the Argus Range, and on the south by the El Paso

Mountains and the Spangler Hills. On the north, the valley is separated from the Coso Basin by a low ridge and a lower narrow divide. The Coso Range lies north of the Coso Basin. Salt Wells Valley lies southeast of the main portion of the China Lake Complex, and is topographically lower than Indian Wells Valley. Low ridges separate the two valleys.

The CLPL is located on the topographic drainage divide or saddle between Indian Wells Valley and Salt Wells Valley. The SWPL area is located to the east of CLPL on the west flank of Salt Wells Valley. Indian Wells Valley and Salt Wells Valley are separated in this area by Lone Butte which is part of the Argus Mountain Range. Faults extend along the southeast and west sides of CLPL. Uplift of basement rock relative to the adjacent valleys has occurred along these faults. In the western and northern portions of CLPL, the basement rocks are overlain by unconsolidated alluvium and possibly older semiconsolidated or lithified sedimentary rock. The thickness of the alluvium and sedimentary formations in the CLPL area is unknown. The older sedimentary formations are of Paleocene to Pleistocene age and are comprised of volcanics, siltstones, sandstones, limestone, shale, clay, and conglomerate.

Little is known or published on the subsurface geology of the Salt Wells Valley. The SWPL is underlain by Quaternary alluvium of unknown thickness. On the western flank of the Salt Wells Valley, the alluvium rests either directly on basement rock, or on older sedimentary formations which overlie basement rock.

Elevations in the Indian Wells Valley vary from approximately 3,000 feet above mean sea level (msl) at the margins of the valley, decreasing to approximately 2,150 feet above msl at China Lake Playa in the southeastern corner of the China Lake Complex. Elevations of the Sierra Nevada peaks to the west exceed 9,000 feet msl, while those of the Coso Range average 6,500 feet above msl with a maximum of 8,156 feet at Coso Peak. The highest point in the Argus Range is Maturango Peak at 8,839 feet above msl.

Broad alluvial fans extend into the valley from Sierra Nevada canyons, forming bajadas several miles wide. The bajadas slope eastward into the east-central portion of the valley, where several low playas are located. Smaller alluvial fans extend into the basin from the south southeast. The largest and lowest of the playas is China Lake, which is an active discharge area for seasonal precipitation. Other playas in the valley include Airport Lake, Mirror Lake, and Satellite Lake, which are all normally dry. However, Phase I field team members noted that Mirror Lake contained a sizeable accumulation of water during and after strong rains in February and March 1992. Depths to ground water at Mirror Lake and Satellite Lake are in excess of 40 to 50 feet below ground surface (bgs).

The Indian Wells Valley is a north-trending fault-controlled basin defined by the surrounding uplifted mountain ranges. Granitic basement complex underlies most of the surrounding bedrock uplifts. The present China Lake Playa is a remnant of the Pleistocene Lakes fed by the glacial meltwater from the Sierra Nevada.

2. AIR: METEOROLOGY AND CLIMATOLOGY

NAWS is located in a desert area, with a corresponding arid climate. Average annual precipitation varies from 3 to 6 inches in the Indian Wells Valley to approximately 10 inches in the Argus mountains to the east and greater than 10 inches along the crest of the Sierra Nevada to the west. The majority of the precipitation occurs between the months of October and March, with December being the wettest month. Typical desert thunderstorms usually

occur in the late summer. Precipitation falls in the form of rain with the exception of occasional snow at the higher mountain elevations. Average annual precipitation, as reported for Armitage Airfield over the ten-year period of July 1982 to July 1992, is 4.78 inches.

Temperatures in the area range from a low of 0 degrees Fahrenheit to a maximum of 118 degrees Fahrenheit, with an average temperature of 63.7 degrees Fahrenheit. The mean daily minimum and the mean daily maximum are 47.4 degrees Fahrenheit and 80.1 degrees Fahrenheit, respectively, with an average daily range of 32.8 degrees Fahrenheit. Prevailing winds in the area are from the southwest, and wind speeds in excess of 25 miles per hour (mph) have been recorded throughout the year. Between October and June, wind speeds in excess of 50 mph are common; the yearly average wind speed is 6.6 mph.

3. WATER

a. SURFACE WATER

The Indian Wells Valley drainage basin receives recharge through surface water runoff from the surrounding mountain ranges. Numerous springs occur in the Argus Range between Argus and Maturango peaks. Additionally, a few freshwater springs are located along the western edge of the Coso Range, the majority of which are above the 6,000 foot level. On the valley floor, there are no naturally occurring perennial streams or lakes on NAWS property. However, a total of 49 springs or seeps were identified within the China Lake Complex. A small portion of Site 49 lie within the Indian Wells Valley. The remainder of Site 49 lies within Salt Wells Valley. Surface water in the Salt Wells Valley is ephemeral and percolates into the ground water or flows into the dry lake bed within the valley.

b. GROUND WATER

Ground water is the sole source of water in the Indian Wells Valley and is used by NAWS, public water districts, and private, industrial, and agricultural users. Prior to 1944, ground water was used mainly for irrigation. In 1912, only eight wells existed, pumping a total volume of approximately 2,000 acre-feet per year (acre-ft/yr). Since 1944, however, ground water has been mainly used by NAWS or for public supply. By 1979, the estimated annual volume of pumped water increased to approximately 26,500 acre-feet, and almost one-third of the total water production in the Indian Wells Valley is pumped along the western boundary of NAWS.

The main water source for the Ridgecrest and China Lake populations is wells in the Inyokern area which is located approximately 8 miles west of the NAWS main gate near Kern County Airport. The Inyokern area provides the major portion of NAWS water supply. The Indian Wells Valley Water District (IWWVD) historically operated water supply wells within the city of Ridgecrest (east of North Mahan Street, known as the "Ridgecrest Area") and in the area between Ridgecrest and Inyokern (known as the "Intermediate Area"). NAWS also operates wells in the Intermediate Area. Three NAWS supply wells are located near the NAWS Intermediate Plant on Highway 178. In addition to these wells, the Ridgecrest Community Hospital and most homes located west of Mahan Road on County land are equipped with individual drinking water wells. Drinking water for the facilities east of Lone Butte mountain (e.g., Skytop, Salt Wells Propulsion Laboratories) originates from the NAWS water supply in the Indian Wells Valley.

V. SIGNIFICANT EFFECTS AND MITIGATION MEASURES

1. Earth

Soils at the site have been contaminated by a variety of toxic compounds due to the disposal of residue from the manufacture and testing of explosive compounds. China Lake proposes to reduce the level of soil contamination by the excavation and off-site disposal of piping, concrete sumps, and other contaminated facilities. Soil instability resulting from the removal of the facilities will be temporary and will be remedied as part of the removal action by the importation of soil or other fill materials. There are no wetlands or riparian areas which would be impacted by the excavation activities.

Therefore, the project will result in a significant reduction in the level of surficial soil contamination and there will be no long-term soil instability at the site; no significant adverse impacts are predicted.

2. Air

Contaminants of concern can be expected to be released to the atmosphere if the project does not take place due to the open nature of the ponds, the fact that the waste material is dry, and the resulting effect of wind action. The contaminants also have the potential to be released to the atmosphere during the removal action by the combination of construction activity and high winds. However, the release to the atmosphere during the removal action will be minimized by the use of water (as a dust abatement measure) during excavation activities. Sludges located on top of artificial liners will be rendered into a slurry by the addition of water in order to facilitate removal by a vacuum truck. In other excavation activities, a water truck or hand-held hose will be used to control air emissions. Removal of contaminants in the ponds will reduce the threat of release to the atmosphere.

Therefore, the project will reduce the threat of ongoing releases to the atmosphere and impacts to the air from this project during construction activities will be controlled; no significant adverse impacts are predicted.

3. Water

Contaminants of concern have the potential to be released to the ground water under current conditions due to the nature of the site; rainwater which enters leaking ponds can produce a downward driving force. The removal action will remove a large portion of the contaminants thereby reducing the potential for contaminants to be released to the ground water. There are no surface waters in the vicinity. Measures to control the release of contaminants to the atmosphere during the removal action will involve the use of relatively small quantities of water. Sludges located on top of artificial liners will be rendered into a slurry by the addition of water in order to facilitate removal by a vacuum truck hence minimizing air emissions. In other excavation activities, a water truck or hand-held hose will be used to control air emissions. Once the contaminants in the ponds have been removed, the threat of release to the ground and surface waters will be reduced.

Therefore, no significant adverse impacts to water as the result of this project are predicted.

4. Plant Life

The China Lake and Salt Wells Propulsion Laboratory compounds are located in an area with a variety of plants. However, plant life within the compounds is minimal. A complete list of plants located in the vicinity is attached. The ponds and other structures which are the subject of this interim removal action are located within the compounds and their removal will not significantly disturb the plant life; no significant adverse impacts are predicted.

5. Animal Life

The China Lake and Salt Wells Propulsion Laboratory compounds are located in an area with a variety of plants which support a number of species, including the endangered Mohave Ground Squirrel and the Desert Tortoise. There are also a number of other species in the vicinity (e.g., the Golden Eagle); a complete list of the plants and animals in the Salt Wells Valley is attached. However, plant life within the compounds is minimal resulting in limited animal life within the compounds; neither the Mohave Ground Squirrel nor the Desert Tortoise have been found during surveys of the area. (Personal communication, Tom Campbell to Jim McDonald, July 20, 1995) The ponds and other structures which are the subject of this interim removal action are located within the compounds and their removal will not significantly disturb the animal life in the vicinity of the compounds. Nonetheless, it is possible that animal life in the vicinity may be currently impacted by the contaminants of concern due to their release to the atmosphere. Once the disposal ponds have been removed, the threat of release to the atmosphere, and hence to endangered species, will be reduced. However, the threat to burrowing animals (if any) will remain unless all soil contamination is removed.

Therefore, the project will reduce the threat of ongoing releases to animal life; no significant adverse impacts are predicted.

6. Land Use

The ponds at the CL/SWPL render the land the ponds occupy unusable. Since this is an interim removal action, the land will continue to be unusable following the removal action. Therefore, the project will have no significant adverse impacts on land use.

7. Natural Resources

This project does not involve, address, nor result in a substantial or potentially substantial change of any natural resource because implementation of the project will require only minimal use of gasoline and diesel fuel for operation of vehicles and heavy equipment.

8. Risk of Upset

Pesticides and radiological agents will not be used for this project. Oil, hydraulic fluid, and diesel fuel will be used by heavy equipment. In the unlikely event of a spill, NAWS will implement spill containment measures. In the event that spillage of contaminated soil occurs during transportation, equipment will be sent to the spill site to remove the spilled material. During transportation, the contaminated material will be covered to prevent release to the environment. During excavation, water will be used for dust suppression. In the event that water becomes unavailable, excavation activities will cease until such time as water becomes available. Finally, a Health and Safety Plan prepared in accordance with California Code of Regulations, Title 7, Section 5192 will be in place which addresses worker and community protection and emergency response activities.

9. Transportation/Circulation

Approximately 4780 cubic yards (cyds) of soil and pond sludge, 320 cyds of gravel, 521 cyds of concrete, 120 cyds of sump sludge, 5 tons of synthetic liners, and an unspecified quantity of vitrified clay pipe will be removed as part of this project. Material classified as "explosive" will be transported in vehicles which conform to federal standards for the transportation of explosive materials (e.g., nonreactive storage beds, placarding, etc.). Based on each truck hauling 20 cyds per load and a three-month project duration, approximately 5 trucks per day will leave the site. Therefore, the project will have minimal impact on traffic patterns in the community; no significant adverse impacts are predicted.

10. Public Services

This project will not require, involve, nor result in change in the need nor availability of governmental services.

11. Energy

This project involves the use of energy for the excavation, transportation, and incineration of contaminated materials. This will result in the stabilization of the waste through the combustion of the explosive and volatile compounds rendering the material suitable for disposal in a Class I landfill. The project will be of short duration (i.e., three months) and will not create a significant demand upon existing sources of energy nor require the development of new sources of energy. Therefore, the project will have minimal impact on energy supplies; no significant adverse impacts are predicted.

12. Utilities

This project does not involve, address, nor result in the need for new utilities. Adequate water service is already provided to the area and will only be used for dust suppression, personal hygiene, and drinking. The site is equipped with toilets; wastewater is disposed of via an existing sewage

collection system. Electrical utilities are also readily available. Therefore, the project will have minimal impact on utilities; no significant adverse impacts are predicted.

13. Noise

The activities for this project will take place in a remote area of the base; the nearest residential area is over 3 miles to the southwest. Furthermore, the construction activities associated with this project are temporary. All people on-site will be personnel associated with the project and will wear appropriate ear protection in accordance with a Health and Safety Plan prepared in accordance with California Code of Regulations, Title 7, Section 5192 which addresses worker and community protection.

14. Human Health

Assuming compliance with all applicable laws and regulations, the Department has determined that implementation of this project does not pose any significant risk to human health. Further, the action is being taken to ensure that the potential threat to public health, welfare and the environment are appropriately managed.

15. Cumulative Effects

Assuming compliance with all applicable laws and regulations, the Department has determined that this project will not have any significant adverse cumulative effects due to: 1) reduction in the potential for the release of pollutants to the atmosphere and ground water; 2) reduction in the threat of injury to China Lake staff stationed at the site and to endangered species in the area; 3) the short duration of excavation and transportation activities; and 4) the use of water for dust suppression during removal activities. The final removal action for the site, if any, will be addressed at a later date. Any final remedial action will be performed in accordance with applicable laws, rules, and regulations.

VI. EXISTING AGENCIES AND ASSOCIATED LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The Applicable or Relevant and Appropriate Requirements (ARARs) which affect the level of control over the project are summarized in Tables 3.3, 3.4 and 3.5. These tables were excerpted from the EE/CA for Site 49.

Substantial or
potentially substantial
adverse change

Yes Maybe No

1. **Earth** Will the proposed result in:

- | | | | |
|---|-----|-----|----------|
| a. Unstable earth conditions or in changes in geologic structures? | ___ | ___ | <u>X</u> |
| b. Disruptions, displacements, compaction or overcovering of the soil? | ___ | ___ | <u>X</u> |
| c. Change in topography or ground surface relief features? | ___ | ___ | <u>X</u> |
| d. The destruction, covering or modification of any unique geologic or physical features? | ___ | ___ | <u>X</u> |
| e. Any increase in wind or water erosion of soils, either on or off the site? | ___ | ___ | <u>X</u> |
| f. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake? | ___ | ___ | <u>X</u> |
| g. Exposure of people or property to geologic hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards? | ___ | ___ | <u>X</u> |

Any adverse

change

Yes No

- | | | |
|--|-----|----------|
| h. Changes to any riparian land or wetlands under state or federal jurisdiction? | ___ | <u>X</u> |
| i. Changes to soil required to sustain habitat for fish and wildlife? | ___ | <u>X</u> |

Explanation: Soils at the site have been contaminated by a variety of toxic compounds due to the disposal of residue from the manufacture and testing of explosive compounds. China Lake proposes to reduce the level of soil contamination by the excavation and off-site disposal of piping, concrete sumps, and other contaminated facilities. Soil instability resulting from the removal of the facilities will be temporary and will be remedied as part of

the removal action by the importation of soil or other fill materials. There are no wetlands or riparian areas which would be impacted by the excavation activities.

Therefore, the project will result in a significant reduction in the level of surficial soil contamination and there will be no long-term soil instability at the site; no significant adverse impacts are predicted.

- | | | Substantial or
potentially substantial
adverse change | | |
|----|---|---|-------|----------|
| | | Yes | Maybe | No |
| 2. | Air Will the proposed result in: | | | |
| a. | Substantial air emissions or deterioration of ambient air quality? | ___ | ___ | <u>X</u> |
| b. | The creation of objectionable odors? | ___ | ___ | <u>X</u> |
| c. | Alteration of air movement, moisture, or temperature, or any change in climate, either locally or regionally? | ___ | ___ | <u>X</u> |

		Any adverse change	
		Yes	No
d.	Degradation of any air resources which will individually or cumulatively result in a loss of biological diversity among the plants and animals residing in that air?	___	<u>X</u>

Explanation: Contaminants of concern can be expected to be released to the atmosphere if the project does not take place due to the open nature of the ponds, the fact that the waste material is dry, and wind action. The contaminants also have the potential to be released to the atmosphere during the removal action by the combination of construction activity and high winds. However, the release to the atmosphere during the removal action will be minimized by the use of water during excavation activities. Sludges located on top of artificial liners will be rendered into a slurry by the addition of water in order to facilitate removal by a vacuum truck. In other excavation activities, a water truck or hand-held hose will be used to control air emissions. Once the contaminated pond materials have been removed, the threat of release to the atmosphere will be reduced.

Therefore, the project will result in a reduction in the threat of ongoing releases to the atmosphere and impacts to the air from this project during construction activities will be controlled; no significant adverse impacts are predicted.

Substantial or
potentially substantial
adverse change

Yes Maybe No

3. **Water** Will the proposed result in:

- a. Changes in currents, or the course of direction of water movements, in either marine or fresh waters? ☐ ☐ ☒
- b. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff? ☐ ☐ ☒
- c. Alterations to the course or flow of flood waters? ☐ ☐ ☒
- d. Change in the amount of surface water in any water body? ☐ ☐ ☒
- e. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to, temperature, dissolved oxygen or turbidity? ☐ ☐ ☒
- f. Alteration of the direction or rate of flow of ground waters? ☐ ☐ ☒
- g. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations? ☐ ☐ ☒
- h. Substantial reduction in the amount of water otherwise available for public water supplies? ☐ ☐ ☒
- i. Exposure of people or property to water related hazards such as flooding or tidal waves? ☐ ☐ ☒

Any adverse
change
Yes No

- j. Change to riparian land, rivers, streams, watercourses and wetlands under state and federal jurisdiction? ☐ ☒
- k. Change to any water resources which will individually or cumulatively result in a loss of biological diversity among the plants and animals residing in that water? ☐ ☒

Explanation: Current conditions result in a high potential for contaminants to be released to the ground water; rainwater which enters leaking ponds can produce a downward driving force. The removal action will remove a large portion of the contaminants thereby reducing (but not eliminating) the potential for contaminants to be released to the ground water. There are no surface waters in the vicinity. Measures to control the release of contaminants to the atmosphere during the removal action will involve the use of relatively small quantities of water. Sludges located on top of artificial liners will be rendered into a slurry by the addition of water in order to facilitate removal by a vacuum truck hence minimizing air emissions. In other excavation activities, a water truck or hand-held hose will be used to control air emissions. Once the contaminated pond materials have been removed, the threat of release to the ground water will be reduced.

Therefore, no significant adverse impacts to water as the result of this project are predicted.

Substantial or
potentially substantial
adverse change
Yes Maybe No

4. **Plant Life** Will the proposed result in:

- | | | | |
|---|-----|-----|----------|
| a. Change in the diversity of species, or number of any species of plant (including trees, shrubs, grass, crops, and aquatic plants)? | ___ | ___ | <u>X</u> |
| b. Reduction of the numbers of any unique, rare or endangered species of plants? | ___ | ___ | <u>X</u> |
| c. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species? | ___ | ___ | <u>X</u> |
| d. Reduction in acreage of any agricultural crop? | ___ | ___ | <u>X</u> |
| e. Deterioration of existing plant habitat? | ___ | ___ | <u>X</u> |

		Any adverse change	
		Yes	No
f.	Any adverse effect to native and non-native plant life?	—	<u>X</u>
g.	Effects to rare and unique plant life and ecological communities dependent on plant life?	—	<u>X</u>
h.	Any adverse effect to listed threatened and endangered plants?	—	<u>X</u>
i.	Effects on habitat in which listed threatened and endangered plants are believed to reside?	—	<u>X</u>
j.	Effects on species of plants listed as protected or identified for special management in the Fish and Game Code, the Public Resources Code, the Water Code, or regulations adopted thereunder?	—	<u>X</u>
k.	Effects on marine and terrestrial plant species subject to the jurisdiction of the Department of Fish and Game and the ecological communities in which they reside?	—	<u>X</u>

Explanation: The China Lake and Salt Wells Propulsion Laboratory compounds are located in an area with a variety of plants. However, plant life within the compounds is minimal. A complete list of plants located in the vicinity is attached. The ponds and other structures which are the subject of this interim removal action are located within the compounds and their removal will not significantly disturb the plant life; no significant adverse impacts are predicted.

Substantial or
potentially substantial
adverse change

Yes Maybe No

5. **Animal Life** Will the proposed result in:

- a. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms or insects)? — — X

- b. Reduction of the numbers of any unique, rare or endangered species of animals? X
- c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals? X
- d. Deterioration to existing fish or wildlife habitat? X

		Any adverse change	
		Yes	No
e.	Effects on listed threatened or endangered animals?	<u> </u>	<u> X </u>
f.	Effects on habitat in which listed threatened and endangered animals are believed to reside?	<u> </u>	<u> X </u>
g.	Effects on species of animals listed as protected or identified for special management in the Fish and Game Code, the Public Resources Code, the Water Code, or regulations adopted thereunder?	<u> </u>	<u> X </u>
h.	Effects on marine and terrestrial animal species subject to the jurisdiction of the Department of Fish and Game and the ecological communities in which they reside?	<u> </u>	<u> X </u>

Explanation: The China Lake and Salt Wells Propulsion Laboratory compounds are located in an area with a variety of plants which support a number of species, including the endangered Mohave Ground Squirrel and the Desert Tortoise. There are also a number of other species in the vicinity (e.g., the Golden Eagle); a complete list of the plants and animals in the Salt Wells Valley is attached. However, plant life within the compounds is minimal resulting in limited animal life within the compounds; neither the Mohave Ground Squirrel nor the Desert Tortoise have been found during surveys of the area. (Personal communication, Tom Campbell to Jim McDonald, July 21, 1995) The ponds and other structures which are the subject of this interim removal action are located within the compounds and their removal will not significantly disturb the animal life in the vicinity of the compounds. Nonetheless, it is possible that animal life in the vicinity may be currently impacted by the contaminants of concern due to their release to the atmosphere. Once the disposal ponds have been removed, the threat of release to the atmosphere, and hence to endangered species, will be reduced. However, the threat to burrowing animals (if any) will remain unless all soil contamination is removed.

Therefore, the project will reduce the threat of ongoing releases to animal life; no significant adverse impacts are predicted.

Substantial or
potentially substantial
adverse change

Yes Maybe No

6. **Land Use** Will the proposal result in a substantial alteration of the present or planned land use of an area?

___ ___ X

Explanation: The ponds at the CL/SWPL render the land they occupy unusable. Since this is an interim removal action, the land will continue to be unusable following the removal action. Therefore, the project will have no significant adverse impacts on land use.

Substantial or
potentially substantial
adverse change

Yes Maybe No

7. **Natural Resources** Will the proposal result in an increase in the rate of use of any natural resources?

___ ___ X

Explanation: This project does not involve, address, nor result in a substantial or potentially substantial change of any natural resource because implementation of the project will require only minimal use of gasoline and diesel fuel for operation of vehicles and heavy equipment.

Substantial or
potentially substantial
adverse change

Yes Maybe No

8. **Risk of Upset** Will the proposal involve:

- a. A risk of an explosion or the release of hazardous substances (including, but not limited to, oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?
- b. Possible interference with an emergency response plan or an emergency evacuation plan?

___ ___ X

___ ___ X

Explanation: Pesticides and radiological agents will not be used for this project. Oil, hydraulic fluid, and diesel fuel will be used by heavy equipment. In the unlikely event of a spill, NAWS will implement spill containment measures. In the event that spillage of contaminated soil occurs during transportation, equipment will be sent to the spill site to remove the spilled material. During transportation, the contaminated material will be covered to prevent release to the environment. During excavation, water will

be used for dust suppression. In the event that water becomes unavailable, excavation activities will cease until such time as water becomes available. Finally, a Health and Safety Plan prepared in accordance with California Code of Regulations, Title 7, Section 5192 will be in place which addresses worker and community protection and emergency response activities.

Substantial or
potentially substantial
adverse change

Yes Maybe No

9. **Transportation/Circulation** Will the
proposal result in:

- | | | | | |
|----|--|-----|-----|----------|
| a. | Generation of substantial additional vehicular movement? | ___ | ___ | <u>x</u> |
| b. | Effects on existing parking facilities, or demand for new parking? | ___ | ___ | <u>x</u> |
| c. | Substantial impact upon existing transportation systems? | ___ | ___ | <u>x</u> |
| d. | Alterations to present patterns of circulation or movement of people and/or goods? | ___ | ___ | <u>x</u> |
| e. | Alterations to waterborne, rail or air traffic? | ___ | ___ | <u>x</u> |
| f. | Increase in traffic hazards to motor vehicles, bicyclists or pedestrians? | ___ | ___ | <u>x</u> |

Explanation: Approximately 4780 cubic yards (cyds) of soil and pond sludge, 320 cyds of gravel, 521 cyds of concrete, 120 cyds of sump sludge, 5 tons of synthetic liners, and an unspecified quantity of vitrified clay pipe will be removed as part of this project. Based on each truck hauling 20 cyds per load and a three-month project duration, approximately 5 trucks per day will leave the site. Material classified as "explosive" will be transported in vehicles which conform to federal standards for the transportation of explosive materials (e.g., nonreactive storage beds, placarding, etc.). Therefore, the project will have minimal impact on traffic patterns in the community; no significant adverse impacts are predicted.

Substantial or
potentially substantial
adverse change

Yes Maybe No

10. **Public Services** Will the proposal have an effect upon, or result in a need for new or altered governmental services in any or the following areas:

a. Fire protection?	___	___	<u>X</u>
b. Police protection?	___	___	<u>X</u>
c. Schools?	___	___	<u>X</u>
d. Parks or their recreational facilities?	___	___	<u>X</u>
e. Maintenance of public facilities, including roads?	___	___	<u>X</u>
f. Other governmental services?	___	___	<u>X</u>

Explanation: This project will not require, involve, nor result in change in the need nor availability of governmental services.

Substantial or
potentially substantial
adverse change

Yes Maybe No

11. **Energy** Will the proposal result in:

a. Use of substantial amounts of fuel or energy?	___	___	<u>X</u>
b. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?	___	___	<u>X</u>

Explanation: This project involves the use of energy for the excavation, transportation, and incineration of contaminated materials. This will result in the stabilization of the waste through the combustion of the explosive and volatile compounds rendering the material suitable for disposal in a Class I landfill. The project will be of short duration (i.e., three months) and will not create a significant demand upon existing sources of energy nor require the development of new sources of energy. Therefore, the project will have minimal impact on energy supplies; no significant adverse impacts are predicted.

Substantial or
potentially substantial
adverse change

Yes Maybe No

12. **Utilities** Will the proposal result in
a need for new systems, or substantial
alterations to any utilities? X

Explanation: This project does not involve, address, nor result in the need for new utilities. Adequate water service is already provided to the area and will only be used for dust suppression, personal hygiene, and drinking. The site is equipped with toilets; wastewater is disposed of via an existing sewage collection system. Electrical utilities are also readily available. Therefore, the project will have minimal impact on utilities; no significant adverse impacts are predicted.

Substantial or
potentially substantial
adverse change

Yes Maybe No

13. **Noise** Will the proposal result in:
- a. Increases in existing noise
levels? X
- b. Exposure of people to severe
noise levels? X

Explanation: The activities for this project will take place in a remote area of the base; the nearest residential area is over 3 miles to the southwest. Furthermore, the construction activities associated with this project are temporary. All people on-site will be personnel associated with the project and will wear appropriate ear protection in accordance with a Health and Safety Plan prepared in accordance with California Code of Regulations, Title 7, Section 5192 which addresses worker and community protection.

Substantial or
potentially substantial
adverse change

Yes Maybe No

14. **Human Health** Will the proposal
result in:
- a. Creation of any health hazard or
potential health hazard (excluding
mental health)? X
- b. Exposure of people to potential
health hazards? X

Assuming compliance with all applicable laws and regulations, the Department has determined that implementation of this project does not pose any significant risk to human health. Further, the action is being taken to

ensure that the potential threat to public health, welfare and the environment are appropriately managed.

Substantial or
potentially substantial
adverse change

Yes Maybe No

15. Cumulative Effects

- a. Will the project result in air or water contamination which by themselves are not significant, but when considered in light of other local sources, may be cumulatively significant?

 X

Explanation: Assuming compliance with all applicable laws and regulations, the Department has determined that this project will not have any significant adverse cumulative effects due to: 1) reduction in the potential for the release of pollutants to the atmosphere and ground water; 2) reduction in the threat of injury to China Lake staff stationed at the site and to endangered species in the area; 3) the short duration of excavation and transportation activities; and 4) the use of water for dust suppression during removal activities. The final removal action for the site, if any, will be addressed at a later date. Any final remedial action will be performed in accordance with applicable laws, rules, and regulations.

Yes No

Summary of Findings Based on study findings as explained herein, justification is made for the following conclusions:

- | | | |
|--|-------|----------|
| a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | _____ | <u>X</u> |
| b. Does the project have the potential to achieve short-term, to the disadvantage of long-term environmental goals? | _____ | <u>X</u> |
| c. Does the project have impacts which are individually limited, but cumulatively considerable? | _____ | <u>X</u> |
| d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | _____ | <u>X</u> |
| e. Do the activities of this project have an influence on recreation, aesthetics, noise, cultural resources, or any other environmental issues which have not been included in this checklist? | _____ | <u>X</u> |

Determination of De Minimus

Yes No

On the basis of this initial evaluation:

I find that there is no evidence before the Department that the proposed project will have potential for an adverse effect on wildlife resources or the habitat upon which the wildlife depends, a **NEGATIVE DECLARATION** with a **FINDING OF DE MINIMUS** will be prepared.

X _____

Determination of Significant Effect

check one

On the basis of this initial evaluation:

I find that the proposed project **COULD NOT** have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.

_____ X _____

The project has been revised to incorporate special changes which assure that there will be no reasonable possibility of significant environmental effects, and a **NEGATIVE DECLARATION** will be prepared.

I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet will be added to the project and listed in the Negative Declaration. A **MITIGATED NEGATIVE DECLARATION** will be prepared. Before the Negative Declaration is approved, the Department of Toxic Substances Control will develop a monitoring program to insure the implementation of these mitigation measures by this agency. All responsible agencies should develop monitoring programs for mitigation measures which are identified under their discretionary authority.

I find the proposed project **MAY** have a significant effect on the environment, an **ENVIRONMENTAL IMPACT REPORT** shall be prepared to determine if significant effects would result.

Signature Lance McMahan Date 7-21-95
Lance McMahan, Project Manager

Signature Anthony J. Landis Date 4-8-96
Anthony Landis, Branch Chief

Initial Study Checklist, Site 49
China Lake Naval Air Weapons Station
China Lake/Salt Wells Propulsion Laboratories
Surface Impoundments and Settling Sumps

REFERENCES

China Lake Naval Air Weapons Station, 1995. Engineering Evaluation/Cost Analysis, Site 49 Removal Action, China Lake/Salt Wells Propulsion Laboratories' Surface Impoundments and Settling Sumps, May.

Personal Communication, Tom Campbell, Biologist, China Lake Naval Air Weapons Station, to Jim McDonald, Environmental Program Manager, China Lake Naval Air Weapons Station, July 21, 1995.

Revised 7/22/93 by DTSC/PEAS

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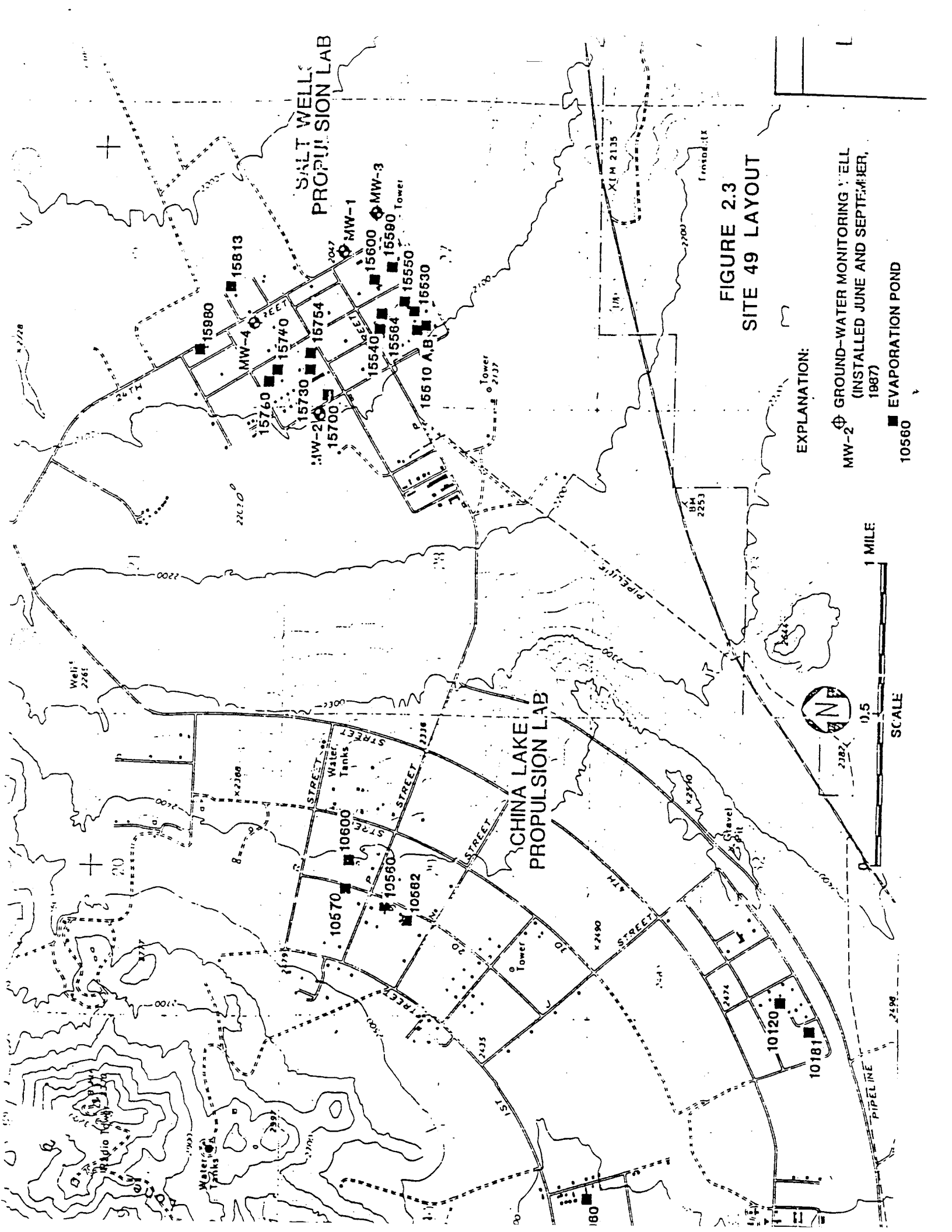


FIGURE 2.3
SITE 49 LAYOUT

EXPLANATION:

- ⊕ GROUND-WATER MONITORING WELL
(INSTALLED JUNE AND SEPTEMBER, 1987)
- EVAPORATION POND

TABLE 3.3
POTENTIAL LOCATION-SPECIFIC ARARS

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Endangered Species Act	16 USC 1531 50 CFR 200 50 CFR 402	Requires action to conserve endangered species with critical habits upon which endangered species depend.	Yes/No	The desert tortoise is a listed threatened species in the Site 49 area.
CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)	42 USC 9601 et seq.	Establishes funding and enforcement authority for a comprehensive response program for past hazardous waste activities.	No/Yes	China Lake NAWS is not a designated Superfund site.
SARA (Superfund Amendments and Reauthorization Act) of 1986	Pub. L. 99-499, 100 Stat. 1613 (1986)			
National Oil and Hazardous Substances Pollution Contingency Plan	40 CFR 300			
Fish and Game Regulations on Pollution	Fish and Game Code, Div. 6, Part 1, Chapter 2, §5650 et seq. §12015	Codifies the prohibition of water pollution with any substance or material deleterious to fish, plant or bird life.	No/Yes	
	Fish and Game Code, Div. 7, Chapter 6, §1600, 2014, 3005	Relevant policies for protection and conservation of fish and wildlife.		
	Fish and Game Code, Div. 3, Chapter 15, Article 2, §2070, 2080, 2090-2096	Requirements for endangered and threatened species.		

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Water Quality Objectives	Regional Water Quality Control Board Criteria	Promulgated criteria setting chemical specific concentration levels for a variety of uses of specific water bodies. Based on the beneficial uses of specific water bodies. Federal water quality criteria are used to set these state standards.	Yes/No	Water quality will be addressed in the RI/FS phase of Site 49.
State Water Resources Control Board's Nondegradation Policy	State Water resource Control Board Resolution No. 68-16	The State Board's policy on maintaining the high quality of California's waters.	Yes/No	Water quality will be addressed in the RI/FS phase of Site 49.
Safe Drinking Water and Toxic Enforcement Act	CA Health & Safety Code, Division 20, Chapter 6.6, §25249.5 et seq.	Prohibition on contamination of drinking water with specific carcinogens and reproductive toxicants.	Yes/No	Water quality will be addressed in the RI/FS phase of Site 49.

TABLE 3.4
POTENTIAL ACTION-SPECIFIC OR PERMITTING ARARS

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Clean Water Act (CWA)	33 USC §1251-1376			
National Pretreatment Standards	40 CFR 403	Sets standards to control pollutants which pass through or interfere with treatment processes in publicly owned treatment works (POTW) or which may contaminate sewage sludge.	Yes/Yes	Wastewater generated from the removal action may be discharged into the City of Ridgecrest's (POTW) depending on the its analytical results.
Solid Water Disposal Act (SWDA) and CA Hazardous Waste Control Laws	42 USC §3251-3259, 6901-6991 CA Health & Safety Code, Div. 20, Chapter 6.5, §25100 et seq. 22 CCR, Div. 4.5	Regulatory statutes designed to provide cradle to grave management of hazardous waste by imposing management requirements on generators and transporters of hazardous wastes and upon owners/operators of treatment, storage, disposal (TSD) facilities.	Yes/Yes	SWDA was amended by the Resource Conservation and Recovery Act (RCRA) and the Hazardous and Solid Waste Amendments (HSWA)
Guidelines for Land Disposal of Solid Wastes	40 CFR 241	Establishes requirements and procedures for land disposal of solid wastes.	Yes/Yes	Treated hazardous wastes as well as noncontaminated solid wastes may require land disposal.
Identification and Listing of Hazardous Waste	40 CFR 261; 22 CCR, Div. 4.5, Chapter 11	Defines solid wastes which are subject to regulation as hazardous wastes.	Yes/Yes	Applies if treated waste is disposed offsite; Must identify listed wastes, etc

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Standards Applicable to Generators of Hazardous Waste	40 CFR 262 22 CCR, Div. 4.5, Chapter 12	Establishes standards for generators of hazardous wastes.	Yes/Yes	May apply to hazardous wastewater or other waste generated from removal actions.
Standards for Owners/Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR 264 22 CCR, Div. 4.5, Chapter 14	Establishes minimum Federal standards which define the acceptable management of hazardous waste for owners/operators of facilities which treat, store, or dispose of hazardous waste.	No/No	Applies to any offsite actions, such as disposal in a RCRA-regulated facility. However, the following discussion applies only to onsite activities at Site 49.
General Facility Standards	40 CFR 264 Subpart B; 22 CCR, Div. 4.5, Chap 14, Article 2		Yes/Yes	Applies to onsite treatment technologies.
Preparedness & Prevention	40 CFR 264 Subpart C; 22 CCR, Div. 4.5, Chap 14, Article 3		No/No	Administrative only.
Contingency Plan and Emergency Procedures	40 CFR 264 Subpart D; 22 CCR, Div. 4.5, Chap. 14, Article 4		No/No	Administrative only.
Manifest System, Recordkeeping and Reporting	40 CFR 264 Subpart E; 22 CCR, Div. 4.5, Chap. 14, Article 5		No/No	Administrative only.

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Release from Solid Waste Management Units	40 CFR 264 Subpart F		Yes/Yes	Applies if treated waste is disposed onsite or if untreated waste remains onsite.
Water Quality Monitoring and Response Programs for Permitted Facilities	22 CCR, Div. 4.5, Chap. 14, Article 6		No/Yes	Water quality will be addressed in the RI/FS phase of Site 49.
Closure/Post Closure	40 CFR 264 Subpart G; 22 CCR, Div. 4.5, Chap. 14, Article 7		Yes/Yes	Establishes requirements for site closure; Applies to removal of ponds and sumps.
Financial Requirements	40 CFR 264 Subpart H; 22 CCR, Div. 4.5, Chap. 14, Article 8		No/No	Not applicable to Federal facilities.
Use and Management of Containers	40 CFR 264 Subpart I; 22 CCR, Div. 4.5, Chap. 14, Article 9		Yes/Yes	Applies if an alternative involves storage of hazardous wastes in containers.
Tanks	40 CFR 264 Subpart J; 22 CCR, Div. 4.5, Chap. 14, Art. 10		Yes/Yes	Applies if an alternative involves storage or treatment of hazardous wastes. Closure of tanks could apply to sumps.
Surface Impoundments	40 CFR 264 Subpart K; 22 CCR, Div. 4.5, Chap. 14, Art. 11		Yes/Yes	Applies to ponds; Specifically, if not all contamination is removed from ponds, need post closure care.

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
Land Treatment	40 CFR 264 Subpart M; 22 CCR, Div. 4.5, Chap. 14, Art. 13		No/No	Land treatment is not an alternative.
Landfills	40 CFR 264 Subpart N; 22 CCR, Div. 4.5, Chap. 14, Art. 14		Yes/Yes	May apply if an alternative involves onsite disposal of treated waste.
Incinerators	40 CFR 264 Subpart O; 22 CCR, Div. 4.5, Chap. 14, Art. 15		Yes/Yes	Applies if an alternative involves incineration.
Containment Buildings	22 CCR, Div. 4.5, Chap. 14., Art. 29		Yes/Yes	Applies if onsite treatment involves treatment within a structure.
Occupational Safety & Health Act	29 USC §651-678 CA Labor Code, Div. 5, §6300 et seq.	Regulates worker health and safety.	Yes/Yes	Under 40 CFR §300.38 requirements of OSHA apply to all response activities under the NCP.
Hazardous Materials Transportation Act	49 CFR 107,121-177	Regulates transportation of hazardous materials.	Yes/Yes	Applies if an alternative involves transportation of hazardous materials.
CA Safe Drinking Water Act	CA Health & Safety Code, Div. 5, Part 1, Chapter 7, §4010 et seq.	Regulations governing public water systems; Drinking Water Quality Standards; Requirements for water quality analysis and laboratories.	No/Yes	Water quality will be addressed in the RI/FS phase of Site 49.

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable/ Relevant and Appropriate	Comment
	23 CCR, Chapter 3, Subchapter 10, §2300 et seq.	Discharge of Waste to Land. Regulations establishing waste and site classifications and waste management requirements for waste treatment, storage, or disposal in landfills, surface impoundments, waste piles, and land treatment facilities.	No/Yes	Applies to closure of the ponds. Also applies if alternative involves onsite disposal.

TABLE 2.3
SPECIES IN SITE 49 AREA

VERTEBRATE SPECIES LIST

REPTILES (most common)

Desert Tortoise *
Side-blotched lizards
Desert horned lizards
Desert iguanas
Zebra-tailed lizards
Western whiptails
Leopard lizards
Chuckwallas
Collared lizards
Western fence lizards
Desert spiny lizards

Gopherus agassizii
Uta stansburiana
Phrynosoma platyrhinos
Dipsosaurus dorsalis
Callisaurus draconoides
Cnemidophorus tigris
Gambelia wislizenii
Sauromalus obesus
Crotaphytus insularis
Sceloporus occidentalis
Sceloporus magister

REPTILES (most common snakes)

Red racers
Gopher snakes
Common kingsnakes
Striped racers
Long-nosed snakes
Western shovel-nosed snakes
Sidewinders
Mojave rattlesnakes
Western rattlesnakes
Speckled rattlesnakes

Masticophis flagellum piceus
Pituophis melanoleucus
Lampropeltis getulus
Masticophis lateralis
Rhinocheilus lecontei
Chionactis occipitalis
Crotalus cerastes
Crotalus scutulatus
Crotalus viridis
Crotalus mitchelli

REPTILES (less common snakes)

Western blind snakes
Western black-headed snake
California lyre snakes
Night snakes
Western patch-nosed snakes
Glossy snakes
Spotted leaf-nosed snakes
Striped whipsnakes
Rosy boas

Leptotyphlops humilis
Tantilla planiceps
Trimorphodon vanderbergi
Hypsiglena torquata
Salvadora hexalepis
Arizona elegans
Phyllorhynchus decurtatus
Masticophis taeniatus
Lichanura roseofusca

* Denotes endangered species.

TABLE 2.3
cont. SPECIES IN SITE 49 AREA

BIRDS (resident)

Golden eagle	<i>Aquila chrysaetos</i>
Red-tailed Hawk	<i>Bufo jamaicensis</i>
Prairie falcon	<i>Falco mexicanus</i>
American kestrel	<i>Falco sparverius</i>
Chukar	<i>Alectoris chukar</i>
Mourning dove	<i>Zenaidura macroura</i>
Greater roadrunner	<i>Geococcyx californianus</i>
Common barn-owl	<i>Tyto alba</i>
Great horned owl	<i>Bubo virginianus</i>
Burrowing owl	<i>Athene cunicularia</i>
Ladder-backed woodpecker	<i>Picoides scalaris</i>
Say's phoebe	<i>Sayornis saya</i>
Horned lark	<i>Eremophila alpestris</i>
Common raven	<i>Corvus corax</i>
Bushtit	<i>Psaltirparus minimus</i>
Bewick's wren	<i>Thryomanes bewickii</i>
Cactus wren	<i>Campylorhynchus brunneicapillum</i>
Canyon wren	<i>Catherpes mexicanus</i>
Rock wren	<i>Salpinctes obsoletus</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
LeConte's thrasher	<i>Toxostoma lecontei</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Brewer's blackbird	<i>Carpodacus mexicanus</i>
House finch	<i>Carpodacus mexicanus</i>
Lesser goldfinch	<i>Pinus psaltria</i>
Black-throated sparrow	<i>Amphispiza bilineata</i>
Sage sparrow	<i>Amphispiza belli</i>
Brewer's sparrow.	<i>Spizella breweri</i>

TABLE 2.3
cont. SPECIES IN SITE 49 AREA

BIRDS (summer residents)

Common poorwill
Lesser nighthawk
Black-chinned hummingbird
Costa's hummingbird
Western kingbird
Ash-throated flycatcher
Gray flycatcher
Blue-gray gnatcatcher
Scott's oriole
Northern oriole
Brown-headed cowbird
Black-chinned sparrow

Phalaenoptilus nuttallii
Chordeiles acutinpennis
Archilochus alexandri
Calypte costae
Tyrannus verticalis
Myiarchus cinerascens
Empidonax wrightii
Polioptila caerulea
Icterus parisorum
Icterus galbula
Molothrus ater
Spizella atrogularis

BIRDS (winter visitors)

Sharp-shinned hawk
Cooper's hawk
Ferruginous hawk
American robin
Dark-eyed junco
White-crowned sparrow
Golden-crowned sparrow
Song sparrow

Accipiter striatus
Accipiter cooperi
Buteo regalis
Turdus migratorius
Junco hyemalis
Zonotrichia leucophrys
Zonotrichia atricapilla
Melospiza melodia

TABLE 2.3
cont. SPECIES IN SITE 49 AREA

MAMMALS (small)

Little pocket mouse
Long-tailed pocket mouse
Desert pocket mouse
Panamint kangaroo rat
Merriam kangaroo rat
Desert kangaroo rat
Western harvest mouse
Canyon mouse
Cactus mouse
Brush mouse
Pinyon mouse
Deer mouse
Southern grasshopper mouse
Desert woodrat
Antelope ground squirrel
Mohave ground squirrel *

Perognathus longimembris
Perognathus formosus
Perognathus penicillatus
Dipodomys panamintinus
Dipodomys merriami
Dipodomys deserti
Reithrodontomys megalotis
Peromyscus crinitus
Peromyscus eremicus
Peromyscus boylii
Peromyscus truei
Peromyscus maniculatus
Onychomys torridus
Neotoma lepida
Ammospermophilus leucurus
Spermophilus mohavensis

MAMMALS (larger)

Audubon cottontail
Jackrabbits
Desert kit fox
Coyote
Gray fox
Ringtail
Badger

Sylvilagus audubonii
Lepus californicus
Vulpes macrotis arsipus
Canis latrans
Urocyon cinereoargenteus
Bassariscus astutus
Taxidea taxus

TABLE 2.3
cont. SPECIES IN SITE 49 AREA

VEGETATION SPECIES LIST

BORAGE FAMILY

Fiddleneck
Forget-me-not

Amsinckia sp.
Cryptantha sp.

BUCKWHEAT FAMILY

Buckwheat

Eriogonum sp.

CACTUS FAMILY

Clustered Barrel Cactus
Bevertail cactus
Old man cactus
Teddybear cholla
Silver cholla

Echinocactus polycephalus
Opuntia basilaris
Opuntia erinacea
Opuntia bigelovii
Opuntia echinocarpa

CALTROP FAMILY

Creosotebush

Larrea tridentata

CAPER FAMILY

Bladderpod

Isomeris arborea

CARROT FAMILY

Mojave parsley

Lomatium mohavense

EPHEDRA FAMILY

Mormon tea
Yellow Ephedra

Ephedra nevadensis
Ephedra viridis

EVENING PRIMROSE FAMILY

Evening Primrose

Camissonia sp.

FIGWORT FAMILY

Paintbrush

Castilleja sp.

FOUR O'CLOCK FAMILY

Sand Verbena

Abronia villosa

GERANIUM FAMILY

Filaree

Erodium cicutarium

GOOSEFOOT FAMILY

Shadscale
Allscale
Fourwing saltbush
Desert Holly
Spiny hopsage
Russian Thistle
Inkweed
Winter fat
Iodine bush

Atriplex confertifolia
Atriplex polycarpa
Atriplex canescens
Atriplex hymenelytra
Grayia spinosa
Salsola iberica
Suaeda sp.
Krascheninnikovia lanata
Allenrolfea occidentalis

TABLE 2.3
cont. SPECIES IN SITE 49 AREA

GRASS FAMILY

Indian ricegrass
Brome
Saltgrass
Needlegrass

Oryzopsis hymenoides
Bromus sp.
Distichlis spicata
Stipa sp.

KRAMERIA FAMILY

White ratany

Krameria grayi

LILLY FAMILY

Brodiaea

Dichelostemma pulchella

MALLOW FAMILY

Apricot Mallow

Sphaeralcea ambigua

MILKWEED FAMILY

Desert Milkweed

Asclepias erosa

MINT FAMILY

Bladder sage
Thistle sage
Chia

Salazaria mexicana
Salvia carduacea
Salvia columbariae

MORNING-GLORY FAMILY

Dodder

Cuscuta denticulata

MUSTARD FAMILY

Spectacle-pod
Desert Alyssum
Prince's plume

Dithyrea californica
Lepidium fremontii
Stanleya pinnata

NIGHTSHADE FAMILY

Box thorn
Jimson Weed

Lycium andersonii
Datura stramonium

PEA FAMILY

Locoweed
Desert Senna
Indigo Bush
Inyo bush lupine
Lupine

Astragalus lentiginosus
Cassia armata
Psoralea argophylla
Lupinus excubitus
Lupinus sp.

PHLOX FAMILY

Gilia

Gilia sp.

POPPY FAMILY

Desert Prickly Poppy

Argemone munita

ROSE FAMILY

Blackbush
Desert Bitterbrush

Coleogyne ramosissima
Purshia glandulosa

TABLE 2.3
cont. SPECIES IN SITE 49 AREA

STICK-LEAF FAMILY

Sandpaper plant

Petalonyx thurberi

SUNFLOWER FAMILY

Goldenhead

Ragweed

Burrobush

Brittlebush

Pincushion Flower

Rabbitbrush

Yellow Rabbitbush

Cheesebush

Mojave Aster

Desert Dandelion

Sand-wash groundsel

Eriophyllum

Matchweed

Coreopsis

Big Sagebrush

Low Sagebrush

Freemont chaffbush

Golden bush

Desert Chicory

Tidy-tips

Acamptopappus sphaerocephalus

Ambrosia acanthicarpa

Ambrosia dumosa

Encelia virginensis ssp. actoni

Chaenactis sp.

Chrysothamnus paniculatus

Chrysothamnus viscidiflorus

Hymenoclea salsola

Machaeranthera tortifolia

Malacothrix glabrata

Senecio douglasii var. monoensis

Eriophyllum sp.

Gutierrezia microcephala

Coreopsis sp.

Artemesia tridentata

Artemesia nova

Amphipappus fremontii

Haplopappus sp.

Rafinesquia californica

Layia glandulosa

WATERLEAF FAMILY

Phacelia

Phacelia sp.